

FAYDYSHA

5 The influence of the size of the crystals upon the luminescence of solids containing anthracene solutions. A. N. Yalovskiy and A. G. Zhukov. *Nash, Zapiski Khr. Dorshev. Univ. im. P. S. Savchenko*, 5: No. 9, Zhurnal Fiz. Khim.; No. 5, 71-0 (1956). — Anthracene (I) crystals were investigated, which contained anthracene (II) as an impurity. It was found that a decrease of the crystal size leads to a noticeable

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F. A. YASH, A. N.

The temperature quenching of the luminescence of
Diacene and anthracene / A. N. Faldutskiy, New York

Faydysh, A.N.

PRIKHOT'KO, N F

24(7)

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PHASE I BOOK EXPLOITATION SOV/1365

L'vov. Universitet

Materialy X Vsesoyuznogo soveshchaniya po spektroskopii. t. 1: Molekulyarnaya spektroskopiya (Papers of the 10th All-Union Conference on Spectroscopy. Vol. 1: Molecular Spectroscopy) [L'vov] Izd-vo L'vovskogo univ-ta, 1957. 499 p. 4,000 copies printed. (Series: Itsi: Fizichnyy sbirnyk, vyp. 3/8/)

Additional Sponsoring Agency: Akademiya nauk SSSR. Komissiya po spektroskopii. Ed.: Jaiser, S.L.; Tech. Ed.: Saranyuk, T.V.; Editorial Board: Landstern, G.S., Academician (resp. Ed., Deceased), Meporent, B.S., Doctor of Physical and Mathematical Sciences, Pabellinakiy, I.L., Doctor of Physical and Mathematical Sciences, Pabellinakiy, V.A., Doctor of Physical and Mathematical Sciences, Korotkiy, V.G., Candidate of Technical Sciences, Rayskiy, S.M., Candidate of Physical and Mathematical Sciences, Klimovskiy, L.K., Candidate of Physical and Mathematical Sciences, Miliyanchuk, V.S., Candidate of Physical and Mathematical Sciences, and Gleuberman, A. Ye., Candidate of Physical and Mathematical Sciences.

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Card 4/30

USSR/Physical Chemistry - Crystals.

B-5

Abs Jour: Referat. Zhurnal Khimiya, No 2, 1958, 3674.

Author : V.M. Agranovich, I. Ya. Kucherov, O.M. Faydisha.

Inst :

Title : Diffusion Shift Length of Exitons in Anthracene Crystals.

Orig Pub: Ukr. fiz. zh., 1957, 2, No 1, 61-67.

Abstract: Continuing the previously published studies (RZhKhim, 1956, 57373), the dependence of the relative luminescence quantum yields B of solid naphthalene (I) solutions in anthracene (II) in the I concentration in the range from 1.5×10^{-6} to 4.7×10^{-6} mole per mole and at the excitation with $\lambda = 365 \text{ m}\mu$ was investigated. B of pure II was assumed to be 1. Within the above mentioned range, B_{II} changes from 0.84 to 0.04, and B_I changes from 0.08 to 0.715. Also the dependence of B on light absorption factor k for $\lambda = 313, 366$ and $405 \text{ m}\mu$ was investigated. B_{II} rises with the rise of k , but B_I drops.

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USSR/Physical Chemistry - Crystals.

B-5

Abs Jour: Referat. Zhurnal Khimiya, No 2, 1958, 3674

APPROVED FOR RELEASE: 08/22/2000 CIA-RDP86-00513R000412510019-8"

Theoretical equations of the dependence of B_I and B_{II} on the I concentration and k were deducted by the solution of the exciton diffusion equation $D(d^2x/dx^2) + \bar{\Phi}_0 \exp(-kx) - fp = 0$, where $f(x)$ is the exciton concentration, D is the diffusion factor, $\bar{\Phi}_0$ is the number of electrons excited in 1 cub. cm in 1 sec at $x = 0$, and p is the probability of exciton disappearance in 1 sec in the result of de-excitation in II molecules, capture in I and extinction. The theory agrees satisfactorily with experiments. It was found from the same equations that the exciton diffusion length in I was about 0.15μ . The observed dependence of B and B' on k is explained by that the depth of exciton formation decreases with the rise of k , i.e., the probability of their arrival at the surface, where they are quenched chiefly in II molecules, rises together with k .

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A.N.
FAYDYSH, I.Ya.
 USSR/Physical Chemistry - Crystals

B-5

Abs Jour : Referat Zhur - Khimiya, No 1, 1958, 237

Author : O.M. Faydysh, I.Ya. Kucherov.

Inst :

Title : Temperature Dependence of Quantum Yield of Luminescence
 of Solid Solutions of Condensed Hydrocarbons.

Orig Pub : Ukr. fiz. zh., 1957, 2, No 1, 68-77

Abstract : The luminescence quantum yield B of anthracene (I) at the excitation by λ of 365 m μ rises monotonously at cooling the anthracene crystal from $+100$ to -140° . In case of crystals of I with an admixture of $1.5 \cdot 10^{-4}$ mole of naphthacene (II) per 1 mole (II does not absorb light of $\lambda = 365$ m μ), B_I rises in the interval $100 - 30^\circ$ more slowly than in case of the pure I, which is ascribed to the decreased life time of excitons. In the interval from -30 to -140° , B_I rises considerably sooner than in case of the pure I, which is attributed to the decreased

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USSR/Physical Chemistry - Crystals

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Abs Jour : Ref Zhur - Khimiya, No 1, 1958, 237

energy transmission from I to II at low temperatures. At the excitation by λ of 436 m μ (region, in which I does not absorb) B_{II} rises monotonously at cooling. The maximum B_{II} is at about -40° and the excitation by λ of 365 m μ . The drop of B_{II} at the heating above -40° and cooling below -40° is attributed to the temperature quenching in molecules and to the decrease of the efficiency of the energy transmission from I to II correspondingly. The same regularity is qualitatively observed in case of crystals of naphthalene with an admixture of I.

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FAYDYSH, A.N.

51-4-9-25

AUTHORS: Kucherov, I.Ya., Faydysh, A.N. and Fesenko, Z.N.

TITLE: Variations of the intensity distribution in the luminescence spectra of anthracene and naphthalene.

(Izmeneniya raspredeleniya intensivnosti v spektrakh lyuminesstentsii antratsena i naftalina.)

PERIODICAL: "Optika i Spektroskopiya" (Optics and Spectroscopy) 1957, Vol.2, No.4, pp.462-469 (U.S.S.R.)

ABSTRACT: Variations in the intensity distribution in the luminescence spectra of anthracene and naphthalene on variation of crystal size and temperature and on introduction of impurities are reported. These variations are related to efficiency of energy transfer between base and impurity. All samples were prepared by melting or sublimation in vacuo. For tests the samples were held in evacuated vessels. For low-temperature tests carbon dioxide and liquid oxygen were used. The conditions of experiments were chosen to make the blackening of the records occur in the linear range of the photographic plate characteristic. In photometric measurements of the recorded spectra spectral sensitivity of plates and absorption in the spectrograph used were allowed for. Quantum intensities ($I/h\nu$) were calculated and from the areas under the quantum intensity curves, quantum yields were found.

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51-4-9/25

Variations of the intensity distribution in the luminescence spectra of anthracene and naphthalene. (Cont.)

Anthracene. Luminescence of anthracene consists of 5 bands. It was excited at $366\text{ m}\mu$ and the effect of crystal size (0.5 mm, 30, 10, 3, 1.5 and 0.3μ thickness) on emission was studied. Emission was measured from that surface of the crystal which was earlier excited (for 0.5 mm crystals it was measured also from the opposite surface). It was found that at 20°C decrease of size caused strengthening of the shorter wavelength region of emission, weakening of the longer wavelengths, and a slight displacement of maxima. Lowering of temperature to -140°C caused considerable intensity redistribution (similar to that described above) in thick (0.5 mm) samples and much smaller redistribution in thin (0.3μ) samples. Heating to $+70^{\circ}\text{C}$ produced increased re-absorption. Re-absorption increases also due to reflection at the crystal surfaces (shown by coating crystals with glycerine). Variation of excitation wavelength (254, 366, $405\text{ m}\mu$) did not affect luminescence of the 0.5 mm crystals. In contrast to earlier work (J.B.Birks and G.T.Wright, Proc. Phys. Soc. B, Vol.67, 657, 1954) no $390\text{ m}\mu$ band was found on excitation with $254\text{ m}\mu$. Addition of 1% of naphthalene or of naphthacene

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51-4-9/25

Variations of the intensity distribution in the luminescence spectra of anthracene and naphthalene. (Cont.)

did not affect luminescence of anthracene at 20°C, but at -140°C naphthacene impurity had a large effect.

Naphthalene. 1.5 mm and 15 μ thick crystals were used and the effects of size were analogous to those for anthracene. On lowering of temperature the vibrational structure of luminescence could be more clearly seen. Addition of anthracene to naphthalene does not affect its luminescence at room temperature. At -140°C large concentrations of anthracene in naphthalene produce strengthening of the shorter wavelengths by re-absorption of anthracene luminescence.

Discussion. Only anthracene is considered (naphthalene behaviour is qualitatively similar). Redistribution of the intensity with change of size and with lowering of temperature is due mainly to re-absorption. Technical quantum yield for 0.5 mm thick anthracene at 20°C is 0.65-0.70 compared with molecular values of 0.9-1.0, but for 1.5 μ and 0.3 μ samples technical and molecular values are approximately the same (in thin samples re-absorption is small). Addition of naphthacene to

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51-4-9/25
Variations of the intensity distribution in the luminescence spectra of anthracene and naphthalene. (Cont.)

anthracene decreases the latter's quantum yield and produces strong naphthalene emission. The transfer of energy from anthracene to naphthalene occurs by an exciton mechanism. The rapid fall of the energy transfer efficiency with decrease of crystal size below 1μ is due to limitation of the exciton paths. There are five figures and fourteen references (six of which are Slavic).

SUBMITTED: July 17, 1956.

AVAILABLE: Library of Congress

Card 4/4

FAYDYSH, A. N.

51-6-18/26

AUTHOR: Faydysh, A. N.

TITLE: Effect of Association of Anthracene Molecules in Naphthalene Crystals on Luminescence Spectra.
(Vliyaniye assotsiatsii molekul antratsena v kristallakh naftalina na spektry lyuminestsentsii.)

PERIODICAL: Optika i Spektroskopiya, 1957, Vol.II, Nr.6, pp. 811-814. (USSR)

ABSTRACT: Naphthalene crystals with 0.1 to 1% of anthracene are used in scintillation counters (Ref.1, 3). Such amounts of anthracene are larger than the density of the saturated solution of anthracene in naphthalene and therefore association of anthracene molecules should occur. This paper deals with changes of luminescence spectra of anthracene due to association of its molecules in naphthalene crystals. The samples were prepared from pure substances in the absence of air. They were heated to 120-130°C and held at that temperature for 30-40 minutes. After this heat treatment the samples were cooled at

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51-6-18/26

Effect of Association of Anthracene Molecules in Naphthalene
Crystals on Luminescence Spectra.

various rates. The samples contained 0.01, 0.1 and 0.5% of anthracene. The luminescence spectra were obtained using a spectrograph MCN-51 and a quartz spectrograph. The samples were excited with a mercury lamp. From the results obtained the author concludes that: (1) Luminescence in crystals with 0.01% of anthracene is due to individual molecules of anthracene and may be called a molecular spectrum. On slow cooling some microcrystals of anthracene are formed also. The microcrystalline spectrum is not observed because of re-absorption. (2) After rapid cooling the spectrum is close to the molecular spectrum and it can be assumed that even 0.5% of anthracene is in the form of individual molecules. This state, however, is not stable and after 2-3 hours the molecules start to associate. After a longer time association proceeds to a state near to microcrystalline aggregation. (3) In the samples which were cooled at intermediate rates both

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Effect of Association of Anthracene Molecules in Naphthalene Crystals
on Luminescence Spectra. 51-6-18/26

association of molecules occurs and microcrystals of anthracene are formed. Student K.V. Moshkova took part in this work. There are 7 references, 3 of which are Slavic.

ASSOCIATION: Kyev State University. (Kiyevskiy gosudarstvennyy universitet.)

SUBMITTED: December 24, 1956.

AVAILABLE: Library of Congress.

Card 3/3

AUTHOR: Faydysh, A.N.

51-4-5-8/29

TITLE: Experimental Verification of the Theory of Diffusion of Excitons
(Eksperimental'naya proverka teorii diffuzionnogo dvizheniya
eksitonov)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol IV, Nr 5, pp. 595-601 (USSR)

ABSTRACT: To explain transfer of energy of electron excitation in organic crystals the present author proposed a phenomenological theory of exciton diffusion (Ref 1). This theory was developed by other workers (Refs 2-5). The present paper deals with quantitative calculations, based on the exciton diffusion theory, which are then checked by comparison with experimental results. As in Refs 1, 2 the case of an infinitely thick layer is considered. The author calculated luminescent quantum yields of the base (B_0) and the impurity (B_x) under various conditions. All calculations were made for anthracene crystals. Dependence of the quantum yields of the base (anthracene) and the impurity (naphthacene) on the impurity concentration calculated on the basis of the author's theory was found to agree satisfactorily with experimental results (Table 1).

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Experimental Verification of the Theory of Diffusion of Excitons

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Addition of a neutral impurity which does not absorb or luminesce in the spectral region studied should lead to reduction of the mean exciton path and consequent reduction in the transfer of energy from the base to the active impurity. Such an effect was, in fact, discovered experimentally (Ref 12) on introduction of naphthalene into an anthracene crystal containing naphthalene as an active impurity. Again good agreement between theory and experiment was obtained (Table 2). Dependences of the quantum yields on the absorption coefficient for the exciting light and on the crystal dimensions also show good agreement between theory and experiment (Table 3, 4). The author deals also with the dependence of photoconductivity of anthracene crystals on the absorption coefficient of the incident light and on the concentration of impurities. Once more satisfactory agreement between the calculated and experimental values was obtained (Table 5). The author concludes that the main assumptions of the exciton diffusion theory are confirmed by experiment. There are 5 tables and 20 references, 11 of which are Soviet, 6 English and 3 American.

Card 2/2

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet (Kiev State University)

SUBMITTED: June 24, 1957

1. Electron excitation-Energy 2. Crystals-Excitation-Theory

24.7700

S/058/62/000/007/046/068
A061/A101

AUTHORS: Faydish, O. M., Slobodyanik, V. V.

TITLE: Dependence of photoconductivity in anthracene crystals on material, shape and directivity of the electrodes

PERIODICAL: Referativnyy zhurnal, Fizika, no. 7, 1962, 32, abstract 7E246
("Visnyk Kyivs'k. un-tu", 1960 (1961), no. 3, ser. astron., fiz. ta khimii, no. 2, 8 - 15, Ukrainian; Russian summary)

TEXT: It is shown that as a result of the formation of barrier layers in crystal-electrode contact points, a significant short-circuit current may be observed in anthracene crystals. Owing to the variable character of the barrier layers, the value of this current may change considerably from one specimen to another. The formation of a space charge in barrier layers tells mainly in the time dependence of photoconductivity under illumination. In some specimens photoconductivity drops considerably after 1 - 2 min of illumination. The presence of barrier layers is confirmed by the dependence of photoconductivity on polarity and by the existence of photo-emf. Investigations on electrodes made from Ag, Zn,

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A061/A101

Dependence of photoconductivity in...

Sn, Al, Bi, aquadag, and India ink have shown that the magnitude of photocurrent in good specimens does not substantially depend on the nature of the electrode material. An exception is Ga whose photocurrent is about five times less than that occurring with other electrodes. Photocurrent has been found to be about five times larger along the b-axis than along the a-axis. It is believed that the strong dependence of photocurrent on the crystallographic direction is associated with the existence of an intermolecular energy barrier which has to be overcome by holes in motion. /B

[Abstracter's note: Complete translation]

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SOV/138-58-8-7/11

AUTHORS: Faydysh, A. M., Chechik, L. Ye. and Chugay, A. D.

TITLE: The Effect of the Degree of Vulcanisation on the Luminescence of Rubbers (Vliyanie stepeni vulkanizatsii na lyuminestsentsiyu reziny)

PERIODICAL: Kauchuk i Rezina, 1959,¹⁹ Nr 5, pp 23 - 32 (USSR)

ABSTRACT: The luminescence of rubbers depends on the composition of the ingredients, on the degree of vulcanisation, ageing, the effect of light etc. The spectra of luminescence of rubbers prepared under various vulcanisation conditions were investigated, especially of rubber mixtures used for the preparation of fibres in the Kiev factory "Krasnyy rezinshchik". A percentage composition of the rubber mixtures is given. A mercury lamp PRK-4 was used during the experiments and the spectra recorded on a spectrograph ISP-51, on an "Izopankhrom" film. Microphotograms of the spectra were registered on a microphotometer MF-4. Photochemical reactions occur during irradiation with ultra-violet rays, and the properties of luminescence of the rubbers change. The experiments showed that the rate of photochemical reaction did not change when the samples were placed in a test tube and the air was evacuated.. The exposure time varied between

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The Effect of the Degree of Vulcanisation on the Luminescence of Rubbers

10 - 20 minutes. The experiments were carried out at room temperature. Tested samples were vulcanised at temperatures of 130, 143 and 151°C for 5, 7, 10, 15, 20, 25, 30, 40 and 45 minutes. The physico-mechanical properties of these rubbers are tabulated (Table 1). It was concluded that the luminescence depends to a large degree on the period and temperature of vulcanisation. These changes are reflected in the intensity of the luminescence and also in the distribution of the energy in the spectra (Figs. 1 - 11). This method can also be used for controlling small changes in the vulcanisates which cannot be detected by other methods. It is necessary to carry out the measurements as quickly as possible so that photochemical reactions should not affect the process. A photoelectric device is recommended for these measurements. Attention should be paid to the changes in the luminescence of the vulcanisates during storing. The character of the changes in the luminescent spectra indicates that changes in the degree of vulcanisation influence various constituents of the rubbers. It is

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The Effect of the Degree of Vulcanisation on the Luminescence of Rubbers

pointed out that the character of the microphotographs depends on the spectral sensitivity of the film. There are 1 Table, 11 Figures, 6 References: 3 Soviet, 1 English, 1 German and 1 Japanese.

ASSOCIATION: Kiyevskiy zavod "Krasnyy rezinshchik" (Kiyev factory "Krasnyy Rezinshchik") and Kiyevskiy gosuniversitet (Kiyev University)

Card 3/3

F. Aydysh, A. N.

48-1-7/20

AUTHORS: Kucherov, I. Ya. , Faydysh, A. N.

TITLE: Migration and Transfer of Energy of an Electron-Excitation in Anthracene- and Naphthalene-Crystals (Migratsiya i peredacha energii elektronogo возбуждения в кристаллах антрацена и нафталина)

PERIODICAL: Izvestiya AN SSSR Seriya Fizicheskaya, 1958, Vol. 22, Nr 1, pp. 29 - 35 (USSR)

ABSTRACT: In the laboratory of the authors the transfer of energy under various conditions in anthracene-crystals with an addition of naphthalene and in naphthalene-crystals with an addition of anthracene in the case of photoexcitation was investigated. All samples investigated were produced by melting pure substances in a vacuum. Measuring the intensity of luminescence was carried out in a photoelectric apparatus with an electrometric amplifier. In most cases investigations were carried out in the case of full absorption and under equal geometrical conditions. In this manner it was possible to determine the relative quantum yield according to the measured intensities of luminescence. With respect to the dependence of the quantum yield in the luminescence on

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48-1-7/20

Migration and Transfer of Energy of an Electron-Excitation in Anthracene- and Naphthalene-Crystals

the concentration it is shown that the introduction of naphthalene into the anthracene-crystal and of anthracene into the naphthalene-crystal leads to a great reduction of the quantum yield and to the intensification of the luminescence of the addition. The quantum yield of the basic substance and additions become equal at a naphthalene-concentration of $2 \cdot 10^{-5}$ Mol Mol⁻¹. The calculation made by the authors shows that with this concentration at the expense of the absorption of the anthracene-luminescence by naphthalene not more than 1 ÷ 2 % of the total excitation-energy of the anthracene-molecules can be transferred. Consequently, the observed effective transfer of energy from anthracene to naphthalene is practically entirely caused by the migration of the excitons in the anthracene-crystal and their capture by the naphthalene-molecules. It is shown that in the naphthalene-anthracene-pair the quantum yield of the basic substance and the addition becomes equal at an anthracene-concentration of $4,3 \cdot 10^{-5}$ Mol Mol⁻¹. In the investigation of the influence of the crystal-dimensions upon the efficacy of the transfer of energy the efficacy of the transfer of energy in the transition from thick crystals to thin films was investigated at room temperature and an excitation of 365 mμ it became evi-

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Migration and Transfer of Energy of an Electron-Excitation in Anthracene- and Naphthalene-Crystals

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dent that at a naphthacene-concentration of about $2 \cdot 10^{-4}$ Mol Mol $^{-1}$ a reduction of the crystal-thickness from 200 to 1μ leads approximately to a threefold decrease in the quantum-yield relation of naphthacene to that of anthracene (B_N/B_A) and in the transition from 1μ to $0,2 \mu$ - to a 3-3,5 fold decrease. This difference in the decrease indicates the occurrence of two different causes which influence the efficacy of the transfer of energy. It is shown that in the first case (from thick crystals to films with 1μ) the decrease is mainly due to the decrease in reabsorption. The part played by the reabsorption consists in the fact that a part of the excitons which underwent an extinction in the basic molecules are again restored due to the absorption of short-wave photons. In this manner the reabsorption leads to an increase in the effective life of the excitons and correspondingly also to an increase in the time of extinction for the luminescence. In the second case (films under 1μ) the limitation of the exciton-passage represents the cause of the great decrease in B_N/B_A . When film-thickness is reduced, a larger number of excitons will always come to the front

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Migration and Transfer of Energy of an Electron-Excitation in Anthracene- and Naphthalene-Crystals

and rear surfaces, where they will mainly illuminate in the base-molecules. The latter must lead to an increase in the quantum yield in the base and to a corresponding decrease in the addition. It is just this effect that was determined by the authors. It is further shown that the introduction of a second addition into the crystal reduces the effective life of the exciton, which is also confirmed in references 18 and 6 by direct experiments. The dependence of the quantum yield in the base and addition on temperature and a calculation of the dependence of the quantum yield on the addition-concentration and on the absorption-coefficient of the exciting light are given. The reabsorption and the possibility of the occurrence of two types of excitons were not taken into account in the calculation. The theory taking these conditions into account was given in references 24, 25. There are 4 figures, 2 tables, and 25 references, 16 of which are Slavic.

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48-1-7/20

Migration and Transfer of Energy of an Electron-Excitation in Anthracene- and Naphthalene-Crystals

ASSOCIATION: **Kiyev State University** imeni T. G. Shevchenko
(Kiyevskiy gos. universitet im. T. G. Shevchenko)

AVAILABLE: Library of Congress

1. Chemistry 2. Crystals-Excitation 3. Crystals-Energy

Card 5/5

~~FAYDYSH~~, Aleksandr Nikolayevich [Faidysh, O.M.], kand.fiziko-matem.nauk;
~~LEVASHOV~~, A.Ye., kand.fiziko-matem.nauk, glavnyy red.

[Elementary particles] Elementarni chastynky. Kyiv, 1959.
38 p. (Tovarystvo dlia poshyrennia politychaykh i naukovykh
snan' URSS. Ser.5, no.4) (MIRA 12:7)
(Particles, Elementary)

FAYDYSH, A.N. [Faidysh, O.M.]; SLOBODYANIK, V.V. [Slobodanyk, V.V.]

Photoconductivity of anthracene. Visnyk Kyiv.un.no.2.Ser.fiz.ta
khim. no.1:3-9 '59. (MIRA 14:8)
(Photoconductivity) (Anthracene--Electric properties)

AUTHORS: Faydysh, A.N. and Zima, V.L.

SOV/51-6-1-17/30

TITLE: Effect of Impurity Concentration on Dependence of the Luminescence Quantum Yields on Thickness of Anthracene Crystals (Vliyaniye koncentratsii primesi na zavisimost' kvantovykh vykhodov lyuminestsentsii ot tolshchiny kristallov antratsena)

PERIODICAL: Optika i Spektroskopiya, 1959, Vol 6, Nr 1, pp 93-101 (USSR)

ABSTRACT: One of the authors (Refs 1, 2) has shown that decrease of the anthracene crystal thickness increases the ratio of the luminescence quantum yields of anthracene (V_a) and naphthacene (V_n), when the latter is present as an impurity. The present paper reports studies of the effect of concentration of naphthacene in anthracene crystals on the behaviour of this ratio with change of crystal thickness. Four concentrations of naphthacene were used: 3×10^{-6} , 8×10^{-6} , 3×10^{-5} and 1×10^{-4} mole/mole. The quantum yields were measured photoelectrically and by heterochromatic photographic photometry. The results obtained are shown in Figs 1-4. Fig 1 gives the dependence of the quantum yield of anthracene luminescence on crystal thickness for four concentrations of naphthacene. Fig 1 shows that the quantum yield of anthracene with 10^{-6} mole/mole of naphthacene increases by 10% when the sample thickness is decreased

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Effect of Impurity Concentration on Dependence of the Luminescence Quantum Yields on Thickness of Anthracene Crystals

to about 1 μ ; for anthracene with 10^{-4} mole/mole of naphthalene a 40% increase in the quantum yield is obtained on decrease of the crystal thickness. Fig 2 gives the dependence of the quantum yield of naphthalene luminescence on the thickness of anthracene layers. In this case decrease of thickness from 40 to 1 μ is accompanied by a considerable change in V_n (80 - 90%) at small concentrations of naphthalene and by a comparatively small change (about 10%) at high concentrations of naphthalene. Fig 3 shows the dependence of the ratio V_n/V_a on the crystal thickness. Decrease of V_n/V_a with decrease of the crystal thickness again depends on the concentration of naphthalene: curves 1 and 2 were obtained for anthracene with 3×10^{-6} and 1×10^{-4} mole/mole of naphthalene respectively. Fig 3 gives the distribution of energy in the luminescence spectrum of anthracene with 3×10^{-5} mole/mole of naphthalene for a thin crystal (curve 1; crystal thickness 0.2 μ) and a thick crystal (curve 2; crystal thickness 40 μ). Fig 4 confirms that transition from thick to thin crystal reduces considerably the quantum yield of naphthalene and increases the quantum yield of anthracene. Decrease of V_n/V_a with decrease of crystal thickness is

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Effect of Impurity Concentration on Dependence of the Luminescence Quantum Yields
on Thickness of Anthracene Crystals

due to two reasons. In thin layers decrease of crystal thickness produces an increase in the number of excitons reaching the crystal surface and most of these excitons transfer their energy to anthracene molecules. In thick crystals decrease of V_n/V_a with decrease of thickness is due to decrease of re-absorption of its own luminescence by anthracene. The effects of concentration of naphthalene on the V_n/V_a ratio are explained by increase of the probability of exciton capture by naphthalene with increase of its concentration. At low naphthalene concentrations decrease of crystal thickness will affect the quantum yield of naphthalene more strongly than the quantum yield of anthracene. The converse is true at high concentrations of naphthalene. There are 4 figures and 4 Soviet references.

SUBMITTED: May 28, 1956

Card 3/3

SOV/138-59-3-12/16

AUTHORS: Faydysh, A.N., Chechik, I.Ye. and Chugay, A.D.

TITLE: Investigations on the Effect of Rubber and its Components on the Luminescence of Synthetic Rubbers (Issledovaniye vliyaniya kauchuka i ingrediyyentov na lyuminestsentsiyu reziny)

PERIODICAL: Kauchuk i rezina, 1959, Nr 3, pp 50 - 54 (USSR)

ABSTRACT: Investigations were carried out on the effect of the length and temperature of vulcanisation on the luminescence of synthetic rubber mixtures (Ref 6). Some of the components and synthetic rubbers were analyzed (see table). The luminescence spectra of the following mixtures were recorded: rubber (Figure 1); zinc oxide and magnesium oxide (Figure 2); Neozone D (Figure 3); crude stearin, zinc stearate and diphenyl guanidine (Figure 4); a rubber-sulphur mixture (Figures 5 and 6); a rubber-sulphur-Captax mixture (Figure 7); a rubber-sulphur-Captax-Neozone D mixture (Figure 8); a rubber-sulphur-

Card 1/2

SOV/138-59-3-12/16

Investigations on the Effect of Rubber and its Components on the Luminescence of Synthetic Rubbers

Captax-zinc oxide mixture (Figure 9); a rubber-sulphur-Captax-zinc oxide-Neozone D mixture (Figure 10) and a rubber-sulphur-Captax-Neozone D-zinc oxide-Altax mixture (Figure 11). It was found that the highest degree of luminescence was obtained with Neozone D and zinc oxide. The luminescence of vulcanisates depends on the luminescence of magnesium oxide, zinc oxide, Neozone D, stearin and zinc stearate. The luminescence of synthetic rubbers in the long-wave-length region is influenced by the presence of magnesium oxide and zinc oxide, and in the short-wave-length region by the presence of Neozone D. Other additives affect the intensity of luminescence of the samples, but do not cause variations in the spectra. When rubber is plasticised and the intensity of luminescence increases, no appreciable changes in the spectra occur. The luminescence spectra of rubber and its components do not have a definite structure.

There are 12 figures, 1 table and 6 references of which 3 are Soviet, 2 English and 1 German.

ASSOCIATION: Gosudarstvennyy universitet i zavod "Krasnyy rezinshchik", g. Kiyev (State University and the "Krasnyy rezinshchik" factory, Kiyev)

Card 2/2

24(7)

AUTHOR:

Faydysh, A. N.

SOV/48-23-1-10/36

TITLE:

On the Influence of the Thickness of Anthracene Impurity Crystals Upon the Luminescence of the Basic Substance and the Impurity (Vliyaniye tolshchiny primesnykh kristallov antratsena na lyuminestsentsiyu osnovogo veshchestva i primesi)

PERIODICAL:

Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959, Vol 23, Nr 1, pp 50 - 56 (USSR)

ABSTRACT:

In the present paper the author investigated the dependence of the ratio between quantum yield of the luminescence of anthracene as basic substance and the quantum yield of the luminescence of naphthacene as impurity on the thickness of the anthracene crystal. The crystal thickness is varied within the limits $200 - 0.15$. The above-mentioned dependence is given in a figure for the anthracene crystal with a naphthacene content of $1 \cdot 10^{-4}$ mol/mol. The curve shows a distinct salient point at a thickness of $\sim 0.9 \mu$, i.e. at a thickness of $< 0.9 \mu$, the quantum yield of the basic substance is considerably larger than that of the impurity. For this

Card 1/3

On the Influence of the Thickness of Anthracene Impurity SOV/48-23-1-10/36
Crystals Upon the Luminescence of the Basic Substance and the Impurity

fact two causes are mentioned according to which the dependence observed is explained below. These are: absorption of the basic substance luminescence by the impurity and capture of the excitons by the impurity which were formed in the crystal. A quantitative calculation of the influence of the crystal thickness was attempted according to the theory of diffusion motion of the exciton in organic crystals (Refs 15,16) and the equation of diffusion was applied. The reabsorption is neglected in the discussion of the case $d \ll 0.9-1$. According to the supposition (and Ref 6) that the probability of exciton disappearance by flare is a linear function of the impurity concentration, the author arrived at a general form of the diffusion equation which is rather simple. By means of this equation the ratio of the quantum yield of the basic substance B_0 to the impurity B_{imp} can be determined. The theoretical values obtained therefrom and

Card 2/3

On the Influence of the Thickness of Anthracene Impurity SOV/48-23-1-10/36
Crystals Upon the Luminescence of the Basic Substance and the Impurity

$$\left(\frac{B_K}{B_B}\right)_{0.4\mu} : \left(\frac{B_K}{B_B}\right)_{1\mu} = 1.25; \left(\frac{B_K}{B_B}\right)_{0.15\mu} : \left(\frac{B_K}{B_B}\right)_{1\mu} = 2.8$$

for the anthracene crystal with an impurity of 10^{-4} mol/mol naphthacene are in good accordance with the data obtained from experience. For considering the reabsorption, the author carried out an approximate calculation of its influence. According to the formulae mentioned, the influence can be calculated that is exercised by reabsorption upon the number of excitons, upon the dependence of exciton concentration on the depth as well as upon the quantum yield of anthracene and naphthacene luminescence. There are 17 references, 13 of which are Soviet.

Card 3/3

S/081/61/000/024/086/086
B101/B110

AUTHORS: Faydysh, A. N., Chechik, L. Ye. Chugay, A. D.,
Przhebyl'skiy, M. I.

TITLE: Rubber luminescence analysis

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 24, 1961, 590, abstract
24P476 (Sb. "Metody lyuminestsentn. analiza". Minsk, AN BSSR,
1960, 90 - 93)

TEXT: A description is given of the apparatus and the results of rubber luminescence analysis: checking of the degree of vulcanization, of aging, composition, and rolling. The UV light exciting luminescence (L) is focused to the rubber specimen whose L is conducted to a photomultiplier. The photocurrent is recorded by a microammeter. The degree of vulcanization is checked from the change of the integral intensity of L. The rubber composition is checked on the basis of the individual spectral regions. The intensity change of L correlates with the change of tensile strength, relative elongation and free sulfur content. A relationship is noted between the intensity of L and tensile strength in the rubber aging processes. [Abstracter's note: Complete translation.]
Card 1/1

PAYLYSH, A.N.; CHECHIK, L.Ye.; CHUGAY, A.D.; PRZHEBYL'SKIY, M.I.

Photoelectric method of measuring the diameter of rubber threads.
Kauch.i res. 19 no.5:52-54 My '60. (MIRA 13:7)

1. Kiyevskiy zavod "Krasnyy rezinshchik" i Kiyevskiy gosudarstvennyy
universitet im. T.G.Shevchenko.
(Kiev--Rubber) (Kiev--Measuring instruments)

FAIDYSH, A.H.

Some questions on the luminescence and photoluminescence of anthracene crystals. Izv.AN SSSR.Ser.fiz. 24 no.5:556-560 May '60. (MIRA 13:5)

1. Kiyevskiy gosudarstvennyy universitet im. T.G.Shevchenko. (Anthracene--Optical properties)

FAYDYSH, Aleksandr Nikolayevich [Faidysh, O.M.], kand. fiziko-mat. nauk;
GURTOVYY, M.Yu. [Hurtovyi, M.IU.], kand. fiz.-mat. nauk, otv.
red.; STAROSTENKO, T.M., red.; MATVIICHUK, O.A., tekhn. red.

[Thermonuclear reactions; on the natural and artificial suns]
Termoiaderni reaktsii; pro pryrodne i shtuchne sontse. Kyiv,
1961. 37 p. (Tovarystvo dlia poshyrennia politychnykh i nauko-
vykh znan' Ukrain's'koi RSR. Ser. 6, no.20) (MIRA 15:2)
(Thermonuclear reactions)

FAYDYSH, A.N.; CHECHIK, L.Ye.; CHUGAY, A.D.; PRZHEBYL'SKIY, M.I.

Control of the degree of vulcanization of rubbers with the aid of
an instrument for luminescence analysis. Kauch.i rez. 20 no.5:
50-53 My '61. (MIRA 14:5)

1. Kiyevskiy zavod "Krasnyy rezinshchik."
(Vulcanization) (Luminescence)

L 19465-63 EPF(c)/EWI(1)/EWI(m)/BDS AFFTC/ASD/SSD Pr-4 RM/WH/MAY

ACCESSION NR: AT3002205

S/2941/63/001/000/0119/0127

AUTHORS: Korsunskiy, V. M.; Faydysh, A. N.

49B

TITLE: Luminescence and excitation energy transfer in anthracene crystals

SOURCE: Optika i spektroskopiya; sbornik statey. v. 1: Lyuminesentsiya. Moscow. Izd-vo AN SSSR. 1963, 119-127

TOPIC TAGS: absorption, luminescence, exciton, organic crystal

ABSTRACT: A thorough analysis was made of the absorption and luminescence spectra of pure anthracene crystals and anthracene mixed with 3.9×10^{-6} , 3.9×10^{-5} and 7.8×10^{-5} mol/mol naphthacene in a temperature range 300-90K. From the data gathered calculations were made to determine the probability of excitation energy transfer and the diffusion length of exciton displacement using a phenomenological argument and the microscopic theory of M. Trilifaj (Chekh. Fiz. Zh., 8, 510, 1958). These calculations indicate that the dipole-dipole resonance theory of excitation energy transfer could be used in studying energy transfer processes in organic crystals. In the region investigated, the excitation energy transfer was shown to vary only slightly with temperature. Orig. art. has: 5 figures, 3 formulas, and 2 tables.

Card 1/1

KORSUNSKIY, V.M. [Korsuns'kyi, V.M.]; FAYDYSH, A.N. [Faidysh, O.M.]

Energy transfer in anthracene crystals with admixtures of phenazine and acridine. Ukr. fiz. zhur. 8 no.6:677-683 Je '63.

(MIRA 16:7)

1. Kiyevskiy gosudarstvennyy universitet im. Shevchenko.
(Anthracene crystals--Spectra) (Quantum theory)

S/051/63/014/003/007/019
E039/E120

AUTHORS: Zima, V.L., and Faydysh, A.N.

TITLE: Luminescence of anthracene crystals obtained by sublimation in an oxygen atmosphere under irradiation

PERIODICAL: Optika i spektroskopiya, v.14, no.3, 1963, 371-377

TEXT: The sublimation is carried out in ampules containing oxygen at a pressure of 1 atm and a temperature of 165 - 170 °C. At the same time the vapor is irradiated with light from a ДРШ-250 (DRSh-250) mercury lamp with a filter isolating the 365 or 313 mmk lines. Supplementary (0) luminescence spectra are observed in these crystals in which the polarization ratio is significantly larger than for the normal spectrum of pure anthracene crystals. From a rough estimate of the concentration of O - centers it is shown that absorption by the O - centers is only a small part of the energy absorbed by the anthracene crystal. It follows that the luminescence of O - centers is accounted for by the transfer of the energy of electron excitation from the crystal to these centers. With a high concentration of O - centers the total quantum yield of luminescent crystals is decreased by about 30% with respect to Card 1/2

Luminescence of anthracene crystals ...

S/051/63/014/003/007/019
E039/E120

the luminescent quantum yield from pure anthracene crystals. The quenching of luminescence apparently depends on the trapping of excitons by photo-oxidized molecules with the subsequent radiationless degradation of the energy of electron excitation. The relatively small efficiency of transmission of energy from crystals to O - centers evidently explains the small overlapping of the luminescent spectra of anthracene crystals and the absorption spectra of O - centers. There are 6 figures.

SUBMITTED: June 7, 1962

Card 2/2

ZIMA, V.L.; KORSUNSKIY, V.M.; FAYDYSH, A.N.

Spectra and the conditions for the transfer of electron excitation
energy in pure and doped anthracene crystals. Izv.AN SSSR.Ser.
fiz. 27 no.4:519-523 Ap '63. (MIRA 16:4)
(Anthracene crystals—Spectra)

L 10588-63

FWP(j)/EFF(c)/FMT(m)/BDS ASD Pc-4/Pr-4 RM/W"

ACCESSION NR: AP3001396

S/0020/63/150/004/0771/0774

AUTHOR: Korsunskiy, V. M.; Faydysh, A. N.

TITLE: Migration of energy of the triplet level in benzophenone crystals

SOURCE: AN SSSR. Doklady, v. 150, no. 4, 1963, 771-774

TOPIC TAGS: triplet exciton, transfer of energy, benzophenone, naphthalene, naphthacene, phosphorescence, energy, triplet level

ABSTRACT: To demonstrate "triplet exciton", the transfer of energy of the triplet level from donor to acceptor molecule or transfer between similar molecules, the transfer of energy from benzophenone crystals to admixtures of naphthalene or naphthacene was studied. Phosphorescence spectra of benzophenone with different concentrations of naphthalene or naphthacene are given. The triplet level of benzophenone was lowered while that of the dissolved naphthalene increased. Since naphthalene does not emit at Lambda 365 millimicrons, the emission must be explained by energy transfer from the benzophenone. In naphthacene the energy is transferred to the first excited singlet as demonstrated by the presence of afterglow in the excited material (Lambda = 436 millimicrons) and by the decrease in the duration of phosphorescence in benzophenone caused by

Card 1/2

L 10588-63

ACCESSION NR: AP3001396

the decrease in the duration of phosphorescence in benzophenone caused by addition of naphthacene. Orig. art. has: 2 figures and 2 tables.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko
(Kiev State University)

SUBMITTED: 25Dec62

DATE ACQD: 01Jul63

ENCL: 00

SUB CODE: 00

NO REF SOV: 006

OTHER: 006

Card 2/2

L 49018-65 EWT(1)/EWT(m)/EPF(c)/EWP(j) Ec-4/Pr-4/P1-4 IJP(c) RM

ACCESSION NR: AR5012284

UR/0058/65/000/003/D075/D075

SOURCE: Ref. zh. Fizika, Abs. 3D602

AUTHOR: Zima, V. L.; Faydysh, A. N.

TITLE: Investigation of anthracene in the longwave region (luminescence of anthracene dimers)

CITED SOURCE: Tr. Komis. po spektroskopii. AN SSSR, vyp. 1, 1964, 679-688

TOPIC TAGS: anthracene dimer luminescence, anthracene absorption band

TRANSLATION: The luminescence spectrum of films of anthracene obtained during sublimation of anthracene in a vacuum is investigated. A very intensive wide band (D) was found near 4,600 Angstroms at -180°C. Illumination of the films with light results in an increase of the intensity of luminescence. Investigation of polarization of luminescence, absorption and electron diffraction patterns revealed that the fundamental mass of the films has an ordinary anthracene lattice structure; however, there are new bands in the absorption spectrum. D-radiation appears in crystals of anthracene as well as in normal films of anthracene after bombardment with electrons.

Card 1/2

L 49018-65

ACCESSION NR: AR5012284

and x-rays. It is proposed that a new type of anthracene luminescence is caused by radiation of anthracene dimers.

SUB CODE: OP,OC

ENCL: 00

TP
Card 2/2

ZIMA, V.I.; SLOBODYANIK, V.V. [Slobodanyk, V.V.]; FAYDYSH, A.R.
[Faidysh, O.M.]

Effect of oxygen on the photoconductivity and luminescence
of anthracene crystals. Dop. AN URSR no. 6:752-756 '64.
(MIRA 17:9)

1. Kiyevskiy gosudarstvennyy universitet. Predstavleno akademikom
AN UkrSSR V.Ye.Lashkarevym [Lashkar'ov, V.IE.].

ZIMA, V.L.; PEKAR', G.S. [Pekar, H.S.]; FAYDYSH, A.N. [Faidysh, O.M.]

Polarization of the luminescence of pure and impurity
anthracene crystals. Dop. AN URSR no.8:1043-1046 '64.
(MIRA 17:8)

1. Kiyevskiy gosudarstvennyy universitet. Predstavleno
akademikom AN UkrSSR S.I. Pekar' [Pekar, S.I.].

L 01264-66 EWT(m)/EPF(c)/EWP(j) RM

ACCESSION NR: AP5020786

UR/0048/65/029/008/1302/1303

AUTHOR: Zima, V. L. Faydysh, A. N.

TITLE: Temperature dependence of the quantum luminescence efficiency of pure and doped anthracene and naphthalene crystals /Report, 13th Conference on Luminescence held in Khar'kov 25 June to 1 July 1964/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 8, 1965, 1302-1303

TOPIC TAGS: luminescence center, impurity center, luminescent crystal, energy transfer, exciton, anthracene, naphthalene

ABSTRACT: The authors briefly review the experimental data, which they and collaborators have published in a series of papers beginning in 1959, on the temperature dependence of luminescence efficiency in pure and doped anthracene and naphthalene crystals. The anthracene crystals contained O and D centers and the naphthalene crystals were doped with *β*-methylnaphthalene. The following conclusions are drawn: 1) The quantum efficiency of the intrinsic luminescence of anthracene and naphthalene crystals decreases by only 5 to 10% when the crystals are heated from 90 to 293°K. 2) The quantum efficiency of the total luminescence of the

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L 01264-66

ACCESSION NR: AP5020786

crystals investigated changes greatly over the above temperature range; this change is due to a change in the quantum yield of defect impurity molecules. 3) The efficiency of excitation energy transfer from the host material to the impurity molecules changes only slightly in the temperature range investigated. 4) In anthracene crystals at 20°K there is efficient transfer of energy from the lattice to O centers. 5) At temperatures for which kT is comparable with electron transition energies in the O centers and in the undistorted lattice, there excitation energy is transferred from the O centers to the lattice; this conclusion is supported by the finding of G.W.Reed and F.R.Lipsett (J. Molec. Spectr., 11, 139, 1963) that the efficiency of energy transfer from naphthalene to naphthacene at 20°K depends strongly on the presence of exciton traps in the lattice. There is evidence that both the probability for energy transfer between molecules in the crystal and the magnitude of the Davydov band splitting are nearly independent of temperature from 20 to 293°K.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: SS, OP

NO REF SQ: 009
Card 2/2

OTHER: 004

L 01258-66 EWT(l)/EWT(m)/EPF(g)/EWP(j) LJP(a) RM

ACCESSION NR: AP5020789

UR/0048/65/029/008/1309/1312

AUTHOR: Raskolod'ko, V. G.; Faydysh, A. N.

TITLE: Phosphorescence spectra and triplet level energy migration in benzophenone crystals /Report, 13th Conference on Luminescence held in Khar'kov 25 June to 1 July 1964/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 8, 1965, 1309-1312, and insert facing p. 1305

TOPIC TAGS: luminescence spectrum, luminescent crystal, solution property, organic crystal, exciton, physical diffusion

ABSTRACT: The phosphorescence of benzophenone crystals, and solutions in alcohol and ether, was investigated at room temperature and at 90 and 20°K, both with and without admixtures of naphthalene or phenanthrene. After purification by multiple vacuum distillation and zone refining, the phosphorescence spectrum of the crystals at 90°K was rather similar to that of the solutions (before the purification and spectra differed considerably, owing to unidentified impurities). At 20°K the crystal spectrum had a series of diffuse bands due to the combination of an

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L 01258-66

ACCESSION NR: AP5020789

electron transition with a 1640 cm^{-1} vibration and a series of quasines which exhibit multiplet structure and arise from the combination of an electron transition with 420 , 810 , and 1640 cm^{-1} vibrations. Introduction of naphthalene into the crystal considerably altered the relative intensities of the quasines, indicating their dependence on crystal defects. Crystals of benzophenone containing naphthalene showed an intense quasine phosphorescence spectrum of naphthalene at 90°K ; the phosphorescence spectrum of phenanthrene in benzophenone crystals, on the other hand, consisted of broad bands. The presence of naphthalene or phenanthrene in benzophenone crystals weakened the intrinsic benzophenone phosphorescence spectrum. From the dependence of the quantum efficiency of benzophenone phosphorescence on the concentration of admixtures, it was concluded that the diffusion constant for excitons is $3 \times 10^{-11}\text{ cm}^2/\text{sec}$ and that an exciton diffuses an average distance of $6 \times 10^{-7}\text{ cm}$ during its lifetime. Orig. art. has: 4 formulas and 4 figures.

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: SS, OF

NO REF SOV:012

OTHER: 005

Card 2/2 *ny*

I 24 22-6 EWT(1)/EWT(m)/EPF(c)/EWP(1)/EEC(L) EWT(1) EWT(m) EPF(c) EWP(1) EEC(L)
 ACCESSION NR: AP5013519 UR/0076/65/022/005/1041/1051
 541.14

AUTHOR: Slobodyanik, V. V.; Faydysh, A. N.

TITLE: Effect of oxygen on the photoconductivity of anthracene crystals

SOURCE: Zhurnal fizicheskoy khimii, v. 39, no. 5, 1965, 1041-1051

TOPIC TAGS: anthracene crystal, photoconductivity, photocurrent

ABSTRACT: The effect of oxygen on the magnitude, kinetics and current-voltage and light characteristics of the photocurrent in anthracene crystals was investigated. In an oxygen atmosphere, the photoconductivity in anthracene crystals is mainly due to the formation of an unstable form of photoconductive anthracene oxides. The photocurrent increases with rising oxygen pressure. Under illumination, the current intensity I changes exponentially with time, and the exponent is proportional to the intensity of the incident light L . It was found that light participates in the formation and breakdown of the photoconductive oxides. In oxygen or air, the dependence of I on the wavelength of the exciting light λ_e is chiefly determined

Card 1/2

L 54033-65

ACCESSION NR: AP5013519

by the change in the absorption coefficient, and in a vacuum, by the energy of the incident photons. After a thorough removal of oxygen from the crystal, the kinetics, light characteristics, and dependence of I on λ_e change considerably. This leads to the conclusion that anthracene crystals possess intrinsic conductivity. A theory was advanced which accounts for the kinetics of photoconductivity and dependence of I on L , and makes it possible to estimate the quantum yield for the formation of charge carriers. Orig. art. has: 6 figures, 1 table, and 5 formulas.

ASSOCIATION: Kiyevskiy gosudarstvennyy universitet im. T. G. Shevchenko (Kiev State University)

DATE: 17Dec62

ENCL: 00

REF CODE: 00, 5M

OTHER: 00

and 200

ACC NR: AP6018443

SOURCE CODE: UR/0051/66/020/006/1022/1029

AUTHOR: Zima, V. L.; Faydysh, A. N.

ORG: none

TITLE: Diffusion of excitons in naphthalene and anthracene crystals. II

SOURCE: Optika i spektroskopiya, v. 20, no. 6, 1966, 1022-1029

TOPIC TAGS: exciton, naphthalene, anthracene, absorption coefficient, quantum yield,
ORGANIC CRYSTAL

ABSTRACT: Two exciton theories are reviewed and compared. In the first, various aspects of the diffusion theory of exciton motion in organic crystals are considered. Starting with the diffusion equation, which holds when reabsorption is negligible, the authors obtain the relation for the quantum luminescence output of the basic substance that has only one impurity, neglecting the emergence of excitons onto the crystal surface away from the exciting light. The theory uses a common basis to establish the dependence of the quantum outputs of the basic substance and the impurity on the concentration of impurity and defects, the coefficient of absorption, crystal thickness, thickness of layers with different impurity concentrations, etc. Experimental evidence convincingly proves the validity of the theory and provides a means for reliably determining the diffusion path length and the probability of exciton annihilation; all these are important factors in the energy migration and transfer processes in crystals

UDC: 532.72 : 539.184 : 548.0

Card 1/2

ACC NR: AP6018443

The theory is deficient in that it does not reveal the relation between exciton annihilation and the properties of the basic substance and the impurity. Furthermore, when the product of the diffusion length and the coefficient of excitation light absorption is less or approximately equal to 0.2, the determination of the diffusion path length is extremely poor. A second theory, using equations analogous to those used for the diffusion of particles in fluids, is compared with the diffusion theory and its advantages and disadvantages are discussed in detail. The quantum outputs are calculated according to the two theories and the results are compared, showing under which conditions the theories agree and diverge. Experimental results show that the exciton diffusion length in naphthalene is half that in anthracene. The diffusion length is but slightly dependent on temperature in the range of 90 to 293°K. It is shown that the probability of energy transfer is governed by the integral of spectral overlap, and depends also on the configuration of the donor-acceptor molecular pairs and the lattice distortions caused by impurity molecules. Orig. art. has: 3 tables.

SUB CODE: 20/

SUBM DATE: 28Dec64/

ORIG REF: 023/

OTH REF: 010

Card 2/2 af

USSR/Medicine - Typhus

FD-1624

Card 1/1 : Pub. 148-4/28

Author : Pshenichnov, A. B.; Raykher, B. I.; and Faydysh, A. T.

Title : Color microagglutination reactions with rickettsial antigens as a method of specifically diagnosing exanthematous typhus

Periodical : Zhur. mikro, epid. i immun. 7, 13-14, Jul 1954

Abstract : An effective microagglutination reaction carried out with drops of serum from suspected typhus patients and standard R. prowazeki strains on objective glasses is described in detail. This method, verified by 10 years of investigation, is extremely accurate, and can be used to diagnose both actual and past cases of typhus, and to test the immunity produced by vaccines. No references are cited.

Institution : Chair of Epidemiology and Microbiology, Molotov Medical Institute and Molotov Oblast Virology Laboratory

Submitted : December 24, 1953

USSR/Virology - Rickettsias.

E-5

Abs Jour : Ref Zhur & Biol., No 15, 1958, 67009

Author : Faydysh, A.T.

Inst : Molotovsk. med. in-ut.

Title : Neutralizing Properties of Serum in Patients Afflicted with Wolhyman Fever.

Orig Pub : Tr. Molotovsk. med. in-ta, 1957, vyp. 26, 217-219

Abstract : Larvae of body lice were infected according to the epidermomebranes method, by Rickettsia Wolmynica, together with the serum from people, taken on the 16-th, 26-th and the 31-st day after the onset of the disease. The larvae were also infected with a mixture of rickettsias and a normal serum (control). The percentage of infected larvae was lower in the experiment than in the control: a complete neutralization has not been noted.

Card 1/2

PANTYSH, A. I., RAYKHAR, L. I.

"An experimental study of the adaptive capacity of the agent of the tick-borne spotted fever in Siberia with a view to the practical utilization of the data obtained." p. 113

Desyatoye soveshchaniye po parazitologicheskim problemam i prirod'nocchnoym boleznyam. 22-29 Okt'yabrya 1959 g. (Tenth Conference on Parasitological Problems and Diseases with Natural Foci 22-29 October 1959), Moscow-Leningrad, 1959, Academy of Medical Sciences USSR and Academy of Sciences USSR, No. 1 254pp.

Perm' Inst. of Vaccines and Sera

FAYDYSH, A.T., dotsent (Perm'); KOSTYLEVA, V.A., kand. med. nauk (Perm')

Professor B.I. Raikher as a teacher and a scientist. Trudy
Perm. gos. med. inst. 43:101-104 '63. (MIRA 17:6)

1 5910-05 EWT(1)/EWT(m)/EPF(c)/EWP(j)/EEC(b)-2 Pc-4/Pr-4/Pe-4 IUP(c)/APAL
SC-4/-5/ARmp)-2/APGC(b)/R.D/SSD/AFETR/ESD(gs)/ESD(t)/RAEH(t) RM
ACCESSION NR: AR4039916 S/0058/64/000/004/D082/D083

SOURCE: Ref. zh. Fiz., Abs. 4D623

73

AUTHORS: Zy*ma, V. L.; Faydy*sh, O. M.

TITLE: Effect of impurities on the luminescence of anthracene
crystals

CITED SOURCE: Visny*k Ky*yivs'k. un-tu, no. 5, 1962, ser. fiz.
ta khimiyi, vy*p. 2, 19-24

TOPIC TAGS: anthracene, luminescence, polarization, absorption
spectrum, exciton, local level, impurity effect,

TRANSLATION: It is shown that if certain impurities (phenazine,
naphthacene, anthraquinone) are introduced into the crystal, the
intensity of strongly-polarized bands in the luminescence spectrum
increases strongly. The most effective in this respect are impuri-

Card 1/2

L 6916-65

ACCESSION NR: AR4039916

ties in which the absorption spectrum overlaps the luminescence spectrum of anthracene. Intense strongly-polarized bands appear also in crystals sublimated in an oxygen atmosphere under intense illumination. It is clear from the results of the investigation that the strongly-polarized bands are due to the emission of the anthracene molecules situated near the impurity molecules. The strong polarization of the luminescence band may be due to radiation from local levels of excitons interacting with the bottom or radiation of molecules having a changed orientation in the lattice Bibliography, 18 titles.

SUB CODE: OP

ENCL: 00

Card 2/2

ACCESSION NR: AP4040770

S/0021/64/000/006/0752/0756

AUTHOR: Zima, V. L., Slobodyanyuk, V. V. (Slobodyanik, V.V.), Faydyush, G.M.
(Faydyush, A. M.)

TITLE: Effect of oxygen on the photoconductivity and luminescence of anthracene crystals

SOURCE: AN UkrRSR. Dopovid, no. 6, 1964, 752-756

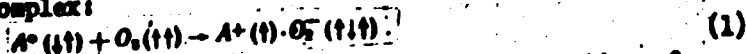
TOPIC TAGS: Photoconductivity, intrinsic photoconductivity, luminescence, luminescence quenching, photooxide, oxidized anthracene, anthracene, naphthalene, phenazine, photoconductive quantum yield

ABSTRACT: The effect of oxygen on the photoconductivity and luminescence of anthracene crystals was studied between -170 and +90 C with light of wavelengths 3130, 3650 and 4050 A. The photoconductivity was found to increase (at all but the lowest temperatures) when the samples were exposed to oxygen; the luminescence was correspondingly quenched. The photoconductivity fell to its "vacuum" value upon evacuation of gases only when the crystals were simultaneously illuminated. The rates of rise and fall of photoconductivity and luminescence quenching were dependent upon temperature and the intensity of illumination. These facts indicated a mechanism whereby excited anthracene molecules interact with oxygen

Card 1/3

ACCESSION NR: AP4040770

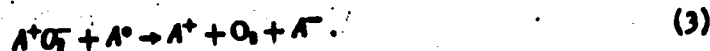
molecules to form an ionic complex:



An exciton interaction scheme can also account for the vacuum rejuvenation of oxidized crystals:



or



From studying the temperature dependence of the photoluminescence quenching by photooxides, an activation energy of 0.17 ± 0.02 eV was established.

The agreement of this energy with the activation energy for photoconductivity (as found in the literature) indicates that the thermal of the photoconductivity is not due to any temperature dependence of the mobility of charges, but that it is directly related to the formation of photooxides. Much evidence points to the conclusion that the observed "vacuum" photoconductivity is, in fact, an intrinsic phenomena. Orig. art. has 3 numbered equations, 2 graphs and 1 table.

ASSOCIATION: Ky-yivs'ky derzhavnyy universytet (Kiev State University)

Card 2/3

ACCESSION NR: AP4040770

SUBMITTED: 03Oct63

ENCL: 00

SUB CODE: CC, OF

NO REF SOV: 003

OTHER: 013

Card 3/3

L 26602-65 EWT(m)/EPF(c)/EWP(j) Pc-h/Pr-h RM
ACCESSION NR: AP4043727 S/0021/64/000/008/1043/1046

AUTHOR: Zima, V. L.; Pekar, G. S. (Pekar', G. S.); Faydysh, O. M. (Faydysh, A. N.)

TITLE: Polarization of the luminescence of pure and impurity-containing anthracene crystals

SOURCE: AN UkrRSR. Dopovidi, no. 8, 1964, 1043-1046

TOPIC TAGS: luminescence spectrum, luminescence polarization, anthracene crystal, luminescence center, lattice defect, exciton

ABSTRACT: To elucidate the nature of crystal luminescence and the character of the temperature dependence of the energy transfer involved, the authors studied the luminescence of "pure" and impurity-containing anthracene crystals in polarized light at 20, 90 and 293K. A diagram of the luminescence spectra of pure anthracene and anthracene containing O-centers is given, together with a photograph of the luminescence spectra of the b and a components of the anthracene crystal at 293K. The study made it possible to distinguish between the natural and "defect" luminescence of the lattice. It was found that the first band of natural luminescence splits into differently polarized components, indicating the exciton origin of this band. The intensity of the natural and defect luminescence, and also of the impurity luminescence of anthracene, depends strongly

Card 1/2

L 26602-65

ACCESSION NR: AP4043727

on the temperature. Causes of this dependence are discussed. Orig. art. has:
2 figures.

ASSOCIATION: Kyivs'kyi derzhavnyi universytet (Kiev state university)

SUBMITTED: 27Dec63

ENCL: 00

SUB CODE: SS, OP

NO REF SOV: 011

OTHEK: 006

Card 2/2

FAYDYSH, V. I.

PA 13/49T13

USSR/Chemistry - Acids, Diabasic
Chemistry - Acids, Colloidal

Jul/Aug 48

"Stabilizing Activities of Anions of Diabasic
Aliphatic and Aromatic Acids on the Hydrocol of
Triethylphosphorus Arsenite," V. I. Faydysh, Chair of Gen
Chem, First Moscow Order of Lenin Med Inst, 5 pp

"Kolloid Zhur" Vol I, No 4 - p.377-21

Homological type anions of diabasic fatty acids pos-
sess considerable stabilization action on the hydrocol
Ac₂S₃. In the stabilization action of anions, there
is a maximum for the second member of the series,
while for subsequent homologues, there is a decrease
in this action on the sol. This action for this
13/49T13

USSR/Chemistry - Acids, Diabasic (Contd) Jul/Aug 48

order of anions decreases regularly, and can be
represented by a linear function based on the number
of members in the hydrocarbon chain. Anions of
aromatic acids, with the exception of the second
members of the series where a minimum was noted, pos-
sess great stabilization action. Coagulating concentra-
tion of potassium salts of organic acids cannot serve
as comparative criteria for judging the degree of
stabilization action on the sol of suitable anions.

13/49T13

PAYDYSH, V. P. Cand. Chem. Sci.

Dissertation: "Effect of Similarly Changed Ions on Electrolytic Coagulation of the Hydrosol of Arsenic Trisulfide." Moscow Order of Lenin State U imeni N. V. Lomonosov, 29 Jan 47.

SO: Vechernyaya Moskva, Jan, 1947 (Project #17836)

PA 3474

USSR/Chemistry - Fatty acids
Chemistry - Colloids

Feb 1947

"Stabilizing Action of Anions of Monobasic Fatty Acids on the Hydrocols of Arsenic Trisulphide," V. P. Faydysh, Chair of General Chemistry, First Moscow Order of Lenin Medical Institute, 5 pp

"Kolloidny Zhurnal" Vol. IX, No. 2

Several facts disclosed as a result of experiments conducted by the author. Anions of homologous order formed by fatty acids have a high stabilizing effect on hydrocols of arsenic trisulphide. This stabilizing effect increases with an increase of the anion count. The stabilizing characteristic of these ions is a

LC

3474

USSR/Chemistry - Fatty acids (Contd)

Feb 1947

Linear function of the number of hydrocarbon radicals contained in the homologous order. The stabilization factor for anions of monobasic fatty acids is determined by the relation to the increase of the concentration of the coagulation of potassium ions for two homologs conforming to the similar concentrations:

$$\left(\frac{\Delta K_o W_{n+1}}{\Delta K_o W_n} \right) \approx 1.3.$$

LC

3474

PAYDYSH, Ye.V., mladshiy nauchnyy sotrudnik

Recent data for establishing permissible concentrations of
sexivalent chromium in the water of reservoirs. Gig. i san.
26 no.7:10-16 JI '61. (MIRA 15:6)

1. Iz instituta obshchey i kommunal'noy gigiyeny AMN SSSR
i kafedry kommunal'noy gigiyeny I Moskovskogo ordena Lenina
meditsinskogo instituta imeni I.M. Sechenova.
(WATER SUPPLY--HYGIENIC ASPECTS)
(CHROMIUM)

FAYDYSH, Ye.V.

New materials for setting up a basis for the permissible concentration of hexavalent chromium in bodies of water. San.okhr.vod.ot zagr.prom. stoch.vod no.5:366-369 '62. (MIRA 17:6)

1. Institut obshchey i kommunal'noy gigiyeny AMN SSSR i kafedry kommunal'noy gigiyeny I Moskovskogo ordena Lenina meditsinskogo instituta.

L 10954-66 EWT(m)/EPF(n)-2/EWP(t)/EWP(b)/EWA(h) IJP(c) JD
ACC NR: AP6004283

SOURCE CODE: GE/0063/65/336/01-/0104/0105

AUTHOR: Fayek, M. K.; Leciejewicz, J.

ORG: [Fayek] Atomic Energy Establishment, Cairo, United Arab Republic;
[Leciejewicz] Institute for Nuclear Research, Swierk Research Establishment,
Otwock, Poland

TITLE: Neutron-diffraction study of Pb sub 3 0 sub 4

SOURCE: Zeitschrift fur anorganische und allgemeine Chemie, v. 336, no. 1-2,
1965, 104-105

TOPIC TAGS: lead oxide, neutron diffraction, crystal structure, crystallography

ABSTRACT:

The oxygen coordination in Pb_3O_4 was investigated by utilizing the diffraction of thermal neutrons, where lead and oxygen atoms have comparable scattering amplitudes of 0.96×10^{12} cm. and 0.577×10^{12} cm., respectively. In the crystal structure of Pb_3O_4 each oxygen atom is bound to two lead atoms at a distance of 2.14 and 2.18 Å, respectively. The results obtained confirm the findings reported by BYSTROM, A., and WESTGREN, A., in Ark. Kemi Mineralog. Geolog., Vol 16B, No 14, 1943 [page number(s) not given]. M. K. Fayek thanks the International Atomic Energy Agency for granting a fellowship during which tenure this work was completed. The technical assistance of Miss Barbara Rutkowska is gratefully acknowledged. Orig. art. has: 1 figure and 5 tables.

SUB CODE: 20 / SUBM DATE: 07Aug64 / ORIG REF: 001 / OTH REF: 010
Card 1/1

FAYER, S.F., inzh.; MEDVEDEVA, D.Ye., inzh.

Use of the OS-20 product in dyeing. Tekst.prom. 21 no.7:66
Jl '61.

(Dyes and dyeing)

(MIRA 14:8)

CHEKMAREV, V.A.; FAYER, S.F.

Practice in the application of the new form of recording the
movement of the fabric through finishing processes. Tekst.prom.
22 no.2:11-12 F '62. (MIRA 15:3)

1. Nachal'nik otdelochnogo proizvodstva Klintsovskoy tonkosukonnoy
fabriki imeni Kominterny (for Chekmarev). 2. Nachal'nik krasil'nogo
tsekha Klintsovskoy tonkosukonnoy fabriki imeni Kominterny (for
Fayer).

(Textile finishing)

ZINOV'YEV, V.Ye.; CHEKMAREV, V.A.; FAYER, S.F.; UCHAMEYSHVILI, Z.V.

From the experience in dyeing lavsan polyester fibers. Tekst.-
prom. 22 no.9:8-11 S '62. (MIRA 15:9)

1. Glavnyy inzhener Klintsovskoy tonkosukonnoy fabriki imeni
Kominterny (for Zinov'yev). 2. Zaveduyushchiy otdechnym
proizvodstvom Klintsovskoy tonkosukonnoy fabriki imeni
Kominterny (for Chekmarev). 3. Nachal'nik krasil'nogo tsekha
Klintsovskoy tonkosukonnoy fabriki imeni Kominterny (for
Fayer).

(Dyes and dyeing--Textile fibers)

FAER, YU. I.
USSR/Pharmacology, Toxicology. Various Preparations

V-6

Abs Jour : Ref Zhur - Biol., No 5, 1958, No 23389

Author : Varshavskaia M.N., Goldenberg M. Iu., Faer, Iu.I.

Inst : Not Given

Title : Regarding Therapeutic Properties of Citral in Some Dermatoses. *Drogbych otkladi dermatovenerologicheskoy dispensarii*

Orig Pub : Vrachebn. dyelo, 1957, No 3, 295-296

Abstract : Thirty nine patients suffering from various forms of eczema were treated with an ointment, containing 0.25-1% of citral. The more acute the process, the less citral was contained in the ointment. The ointment was prepared on a base consisting of 40 parts of paraffin, 10 parts of lanolin and 50 parts of vaseline. A therapeutic effect was observed in 29 patients.

Card : 1/1

SHTEYNBERG, M.A.; FAYER, Yu.I.; GOL'DENBERG, M.Yu.

Use of prednisone ointment in the treatment of some dermatoses.
Vrach. delo no.9:109 S '61.

(MIRA 14:12)

1. Drogobychskiy kozhko-venerologicheskiy dispanser (nauchnyy
rukovoditel' - professor M.A.Shteynberg).
(SKIN--DISEASES) (PREGNADIENEDIONE)

SHTEYNBERG, M.A.; FAYER, Yu.I.; GOL'DENBERG, M.Yu.

Structure and dynamics of the incidence of skin diseases data from the Drogobych Dermatovenereological Clinic collected during 10 years. Vest.derm.i ven. 35 no.1:68-72 Ja '61. (MIRA 14:3)

1. Iz Drogobychskogo kozhno-venerologicheskogo dispansera (glavnyy vrach - kand.med.nauk M.Yu. Gol'denberg, nauchnyy rukovoditel' - prof. M.A. Shteynberg).

(DROGOBYCH—SKIN—DISEASES)

GOL'DENBERG, M.Yu., kand. med. nauk; FAYER, Yu.I., vrach (Drogobych)

Incidence of skin diseases among the rural population. Sovet.
zdravookhr. 5:37-40'63 (MIRA 17:2)

1. Iz Drogobychskogo mezhrayonnogo kozhno-venerologicheskogo
dispansera.

FAYER, Yu.I., vrach; GOL'DENBERG, M. Yu., ~~med. dok. nauk~~

Determination of incapacity for work and rational job
placement of patients with chronic dermatoses. Vest.
derm. i ven. 37 no.1:70-72 Ja'63. (MIRA 16:10)

1. Iz Drogobychskogo mezhrayonnogo kozhno-venerologicheskogo
dispansera (glavnyy vrach M.Yu. Gol'denberg).
(DISABILITY EVALUATION) (SKIN--DISEASES)

FAYERBERG, I.I., kand.tekhn.nauk

Bending of a plate caused by a load distributed along a line.
Trudy MFTI no.5:3-8 '60.

(Elastic plates and shells)

(MIRA 13:10)

10.6000 1327

32764
S/658/61/000/007/003/010
D251/D302

AUTHOR: Fayerberg, I.I., Candidate of Technical Sciences
TITLE: On the flexion of a cantilever plate
SOURCE: Moscow. Fiziko-tehnicheskiye institut. Trudy, no. 7, 1961. Issledovaniya po mekhanike i prikladnoy matematike, 46 - 57

TEXT: The author considers the problem of the transverse flexion of a cantilever plate of constant cross-section, the regions of the plate being considered finite and singly-connected, and bounded by a rectilinear section along the axis of symmetry $a - b$ and an arbitrary, sufficiently smooth curve terminating at a and b . The rectilinear part of the boundary is rigidly fixed, and the rest is free. The problem is treated by complex variable methods. The boundary conditions are found to be of the form

$$\chi \varphi_0(t) + \overline{t \varphi_0'(t)} + \overline{\psi_0(t)} = F(t) \quad (13)$$

$$\text{on } L = l_1 + l_2$$

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On the flexion of a cantilever plate

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where $\kappa = -(3 + \nu)/(1 - \nu)$, ν = Poisson's coefficient,

$$F(t) = G(w_0) + \frac{t}{8D} \sum_{n=0}^{\infty} a_n \left[\frac{\kappa t^{n+2}}{(n+1)(n+2)} - \frac{t^{n+1}}{n+1} + \frac{t^{n+2}}{n+2} \right] + \quad (14)$$

$$+ ic_j t + c_j' \quad (j=1, 2). \quad (14)$$

where D is the cylindrical rigidity

$$G(w_0) = - \int_0^1 \left[2 \frac{\partial^2 w_0}{\partial t^2} \frac{d\bar{t}}{dt} + (\kappa + 1) \frac{\partial^2 w_0}{\partial t \partial \bar{t}} + \right. \quad (8)$$

$$\left. + (\kappa - 1) \int_0^1 \left(\frac{\partial^3 w_0}{\partial t^2 \partial \bar{t}} dt - \frac{\partial^3 w_0}{\partial t \partial \bar{t}^2} d\bar{t} \right) dt; \right]$$

where c_j are real constants, c_j' complex constants, t the affix of points on L, $\varphi(z)$ and $\lambda(z)$ are functions of z , $\psi(z) = d\lambda(z)/dz$. The problem is clarified in Fig. 1. $z = \omega(\xi)$ is taken to be a function giving a conformal transformation of the unit circle $|\xi| < 1$ onto

Card 2/A₃

On the flexion of a cantilever plate

32764
S/658/61/000/007/003/010
D251/D302

S. The values of ξ on the unit circle γ are denoted by $\sigma = e^{i\theta}$.
Hence, (13) becomes

$$\kappa\varphi_1(\sigma) + \frac{\omega(\sigma)}{\omega'(\sigma)} \overline{\varphi_1'(\sigma)} + \overline{\psi_1(\sigma)} = F(\sigma) \text{ on } \gamma \quad (15)$$

where $\varphi_1(\sigma) = \varphi_0[\omega(\sigma)]$; $\psi_1(\sigma) = \psi_0[\omega(\sigma)]$ and $F(\sigma)$ is the transform of the right-hand-side of (13). It is observed that if S may be conformally transformed by means of a polynomial or rational function onto $|\xi| \leq 1$, then (15) can be solved by the method of N.I. Muskhelishvili (Ref. 2: Nekotoryye osnovnye zadachi matematicheskoy teorii uprugosti, (Some Basic Problems of the Mathematical Theory of Elasticity) AN SSSR, 1954). From a solution of (15) the flexion may be found. The case of a semicircular plate of uniform load is considered as an example. In conclusion the case of a plate, whose contour in parametric form is $x' = c(\cos \theta + m \cos 2\theta)$; $y' = c(\sin \theta - m \sin 2\theta)$, is considered. The solution is obtained by means of Cauchy integrals, a method established by D.I. Sherman (Ref. 6: IAN SSSR, OTN, no. 9, 1948). There are 1 table, 4 figures and 6 Soviet-bloc references. X

Card 3/4₃

FAYERBERG, I.I. (Moskva)

Bending of a circular plate supported along the chords. Inzh.
zhur. 3 no.1:78-85 '63. (MIRA 16:10)

(Elastic plates and shells)

PAYMENT, T.I.

(1967)

Bending of an orthotropic elliptic plate freely supported
along the contour. Izv. Akad. Nauk SSSR, 1967, No. 2, 161-166.

(1967, 17:8)

FAYERBERG, Ya.L.

Machine for the preparation of kersey boot tops for the vulcanization of the top band and back strap. Leh. prom. no.3:36 38
Jl-S '65. (MIRA 18:9)

DUM, E.V.; FAYERMAK, B.G.; BRONFEN, P.M.

The SBG-lm boring machine for boring gas drainage holes in coal mines. Ugol' 40 no.12:60-61 D '65. (MIRA 18:12)

1. Giprouglegormash, Karaganda (for Dum). 2. Mashinostroitel'nyy zavod Karagandinskogo soveta narodnogo khozyaystva (for Fayermak, Bronfen).

FAYERMAN, A.I.; MATSOV, M.M.

Method of calculating depreciation and expenditures for the repair of
welding equipment. Avtom.svar.6 no.3:50-54 My-Je '53. (MLRA 7:5)
(Welding)

B. T. R.
Vol. 3 No. 4
Apr. 1954
Engineering Economics

② Sub. Ing 3
4940* Planning and Calculation of Basic Cost Accounting
Indices of a Tool Shop. (Russian.) A. M. Mikhailov and A.
I. Eremkin. Vestnik Mashinostroeniia, v. 33, no. 9, Sept. 1953,
p. 93-95.
Discusses simplification and acceleration of accounting pro-
cedures.

6-4-54
JEP

FAYERMAN, A. I.

Subject : USSR/Electricity AID P - 862
Card 1/1 Pub. 11 - 8/13
Authors : Fayerman, A. I., Matsov, M. M., Stoma, V. V. and
Bukhbinder, N. I.
Title : Selection of semi-automatic welder arrangement
Periodical : Avtom svar., #4, 78-82, J1-Ag 1954
Abstract : Comparison of operating performance and initial cost of
three types of semi-automatic welders is presented with
2 controlling circuits and 3 tables with operational data.
Institution : None
Submitted : J1 20, 1953

FAYERMAN, A.I.

112-3-6099

Translation from: Referativnyy Zhurnal, Elektrotekhnika, 1957,
Nr 3, p. 153 (USSR)

AUTHOR: Fayerman, A. I.

TITLE: Selection of D-C Power Supplies for Manual Arc Welding
(Vybor sistem pitaniya postov ruchnoy elektrodugovoy
svarki postoyannym tokom)

PERIODICAL: Tr. Leningr. politekhn. in-ta, 1956, Nr 183, pp.
pp. 172-184

ABSTRACT: Technical and economic analysis of the conditions re-
quired for more efficient single-operator and multiple-
operator d-c feed systems for manual welding has shown
that the main advantages of the multiple-operator sys-
tem are: 1) greater reliability and ease of mainte-
nance of rectifiers; 2) smaller initial outlay for
welding equipment; 3) smaller amortization, mainte-
nance and repair expenses per operator. These advan-
tages are realized by: 1) concentrating a considerable
amount of power in one multiple-operator machine, which
permits a decrease in cost of 1 kw of rated power; 2)
operating the multiple-operator generator under a con-
tinuous load, thus permitting a lower rated generator

Card 1/4

112-3-6099

Selection of D-C Power Supplies for Manual Arc Welding (Cont.)

output per operator as compared with the single-operator generator operated under repeated loads of short duration. The main disadvantage of multiple-operator generators is the greater power consumption for welding due to losses in the ballast rheostats. A technical and economic comparison is made of the ПС-300 single-operator rectifier feed system and the ПСМ-1000 multiple-operator rectifier feed system used in welding by means of Э42-A type electrodes with electrode cover of the ЮНМ 13/45 type, for four values of welding current I_{weld} per welding unit and three values of average electric arc switching-on factor ϵ for each I_{weld} , for two-shift operation and a machine operation period of 4,666 hours per year. The comparison is made on the basis of initial outlay and operational expenditures. The tables, charts and computations presented show that the multiple-operator system is inefficient when there is a small number of operators. The efficiency of the system increases with the number of operators. At the same time, the specific power of the multiple-operator system consumed in welding is considerably greater than that of the single-operator system. Computations show that 64% of the electric power

Card 2/4

112-3-6099

Selection of D-C Power Supplies for Manual Arc Welding (Cont.)

supplied by the multiple-operator generator is consumed in the ballast rheostats and in the network of the welding points, which is an indication of the importance of power economy. The multiple-operator feed system can be used to greatest advantage only on the condition that multiple-operator machines be operated in parallel. This system permits current feed to the welding points at a lower demand factor, and, consequently, at a higher average rectifier load. As a result, there is effected a decrease in the installed substation capacity and of the welding rectifier per operator, and at the same time the specific power consumption is reduced. The tables also indicate that greater economy is not obtained by increasing the number of machines in a group operated in parallel at average values of current (approximately 220 a) and with a switching-on factor $\epsilon = 0.3$ to 0.5. For this reason, in the event a shop requires more than four multiple-operator rectifiers, it is suggested that 2 or 3 machines be supplied by one rectifier in parallel operation of the rectifiers. Thus, multiple-operator feed systems in which the generators supply a common network are most efficiently applied in welding shops where there is a large number of operators requiring a total of more than two machines. This system is especially efficient if a shop has a large number (6 - 8) of multiple-operator units, each of which

Card 3/4